

project WEB

Winter
2007

Connecting Projects WILD, WET and Learning Tree in New Hampshire

Resources Go Round

Most people use nonrenewable natural resources for electricity, to heat their homes and to operate their vehicles. We also tend to buy synthetic products that are made from nonrenewable natural resources. The most common nonrenewable resources used today are fossil fuels.

Fossil fuels, such as coal, natural gas, crude oil and propane, are created from the decayed remains of plants and animals. They can be found naturally as a solid, liquid or gas. Almost 90% of New Hampshire residents use fossil fuels for transportation, home heating and electricity (Office of Energy & Planning, 1999).

Fossil fuels take thousands, or even millions, of years to form naturally and cannot be made again in a short period of time. These resources are high in carbon and when they are used as fuel, the carbon is released back into the atmosphere as carbon dioxide. An increasing amount of carbon dioxide in the atmosphere has been linked to global warming.

In our fall issue, you learned about renewable energy resources. In this issue we will focus on nonrenewable sources. You will hear from companies that generate energy and those trying to help minimize our footprint on the environment. Let's explore the world of nonrenewable natural resources.



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Oil – Critical for Transportation

*"In the end we will
conserve only what we
love. We will love only
what we understand.
We will understand only
what we are taught."
- Baba Dioum*

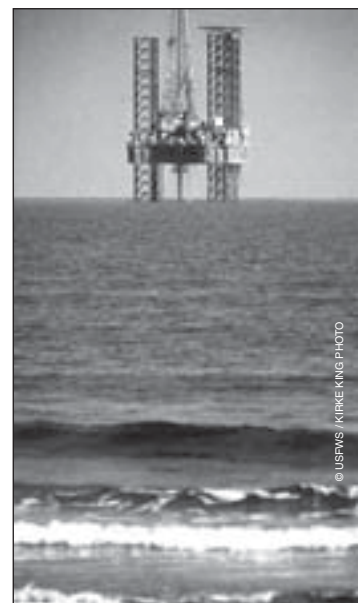
Oil is a widely used fossil fuel because it is a source of energy with diverse applications (power stations, home heating, engines). Oil is found naturally in the environment as a liquid. Products made from oil help us do many things. We use oil for fuel in airplanes, cars and trucks. In New Hampshire, gasoline used to power motors represents 24% of the entire energy consumption for the state (N.H. Office of Energy & Planning, 1999). Oil also is used to make products as varied as crayons, dishwashing liquids, tires, ammonia, ink and heart valves.

These products make our lives easier, but finding, producing, transporting and using them can cause problems for our environment. Over the years, new technologies and laws have helped to reduce these problems. As it does with any industry, to reduce the impact on the environment, the government monitors how oil is produced, refined, stored and sent to market.

Oil is easily transported via pipelines, tankers and trucks. However, during transport, oil spills can occur. Oil that leaks from tankers into the seas and oceans can cause a significant shock to wildlife

because so much oil is released at one time. Only 2% of all oil spills actually come from tankers or barge spills, though. More oil gets into the water from natural oil seeps coming from the ocean floor, or from leaks that happen when we use petroleum products on land. Gasoline sometimes drips onto the ground when people fill their gas tanks, motor oil may be disposed of improperly after an oil change, or fuel can escape from a leaky storage tank. When it rains, these spilled products get washed into the gutter and eventually get to a river or ocean.

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Alaskan offshore oil rig.

© USFWS / KIRK KIRK PHOTO



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New Hampshire
Fish and Game
Department

Nuclear Energy from Seabrook Station

In New Hampshire, almost 40% of the electricity generation is from a nuclear source (Energy and Administration, 2005). Seabrook Station, New Hampshire's only nuclear power plant, is located on a 900-acre site in the towns of Seabrook, Hampton and Hampton Falls.

Nuclear energy is fueled by uranium, which is a natural ore found in the ground. Unlike the coal, gas and oil plants, a nuclear plant does not burn its fuel. Pressurized water reactors and boiling water reactors are the primary nuclear reactors used to generate nuclear electricity in the U.S. The

Seabrook plant uses a pressurized water reactor.

Pressurized water reactors have three distinct loops of water. In the primary system, the uranium fuel heats water through fission. This hot water is pumped into a piece of equipment called a steam generator and circulated through thousands of tubes. A separate supply of water flows over the hot tubes of reactor water and turns into steam in the secondary system. The steam turns fan-like blades of a turbine, spinning the shaft of an electric generator and producing electricity.

The non-radioactive steam is turned back into water in the condenser by a third system that provides cooling water. Cooling water is circulated through tubes, and the steam flows over the tubes, condensing back into water to begin the cycle again. The source of the condenser cooling water at the Seabrook plant is the Atlantic Ocean, from which seawater is drawn through a 17,140-foot tunnel that extends more than a mile offshore.

When the plants' uranium fuel no longer contains enough energy to produce electricity efficiently, the used fuel is

removed from the reactor. The used fuel is then stored in stainless steel-lined concrete pools of water on the plant site. This is called "wet storage."

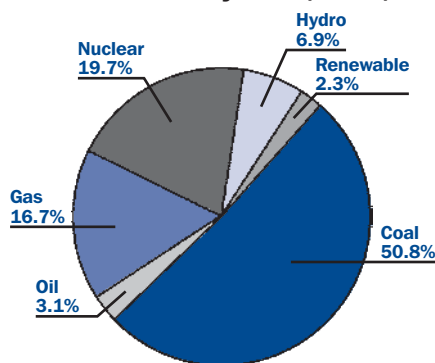
The World Association of Nuclear Operators has rated Seabrook Station as one of the top-performing U.S. nuclear power stations. Seabrook Station maintains high operating standards and meets or surpasses regulatory requirements. To further protect the public, the nuclear units are designed to use automatic safety systems and multiple safety barriers as part of a "safety first" policy at the plant.

Nuclear energy offers many benefits and is an important part of our energy mix in the competitive wholesale market in the northeastern U.S. This technology has virtually no emissions, which helps keep the air clean, preserve the earth's climate, avoid ground-level ozone formation and prevent acid rain. However, a major concern related to nuclear power generation is disposal of spent fuel rods.

For more information on Seabrook Station, call (603) 773-7219 or visit www.fpl.com.



Share of Total U.S. Electricity Generation by Fuel(2003)



Activities Related to Articles in This Issue

Project WET suggests:

In the activity, *Get the Groundwater Picture*, students will learn about basic groundwater principles as they create their own geologic cross-section or earth window.

When discussing environmental issues like nonrenewable resources, it is important to analyze the public *Perspectives* in order to help evaluate different approaches to managing environmental issues.

Through the familiar game of Concentration, students make connections between modern and past water-use practices in the activity, *Water Concentration*. Students also discuss how attitudes toward water have changed as water-use practices have evolved.

Project Learning Tree suggests:

In *Energy Sleuths*, students learn about different sources of energy and explore the advantages and disadvantages of their use. Students learn how they use energy in their daily lives.

Ever wonder what goes into making aluminum cans? The activity, *A Look At Aluminum*, takes students through the energy-intensive, multi-step processes of mining, refining and producing aluminum. This activity also introduces the students to the environmental impact of aluminum.

Patterns for reducing solid waste can be seen in community efforts to recycle resources and reduce consumption. In *Reduce, Reuse, Recycle*, students set up a program for reusing, recycling and reducing consumption of resources at school.

Project WILD suggests:

Students learn how pesticides enter food chains – and the possible consequences when they do – by becoming hawks, shrews and grasshoppers in the physically active, *Hazardous Links, Deadly Solutions*.

What Did Your Lunch Cost Wildlife? has students trace food sources, diagram environmental impacts and apply the knowledge they gain by making changes in some of their own consumer choices.

After students plan and calculate the costs of a family's meals for one day in *Lobster in Your Lunch Box*, they create a classroom chart and analyze, discuss and summarize their findings.



Public Service of New Hampshire

Public Service of New Hampshire (PSNH) is New Hampshire's largest electric utility, serving more than 490,000 homes and businesses statewide. Founded in 1926, the company owns and operates a diverse fleet of generating stations, including three fossil-fuel plants, a wood-burning plant and nine hydroelectric facilities.

PSNH's mission is to provide safe, reliable and economic service to its customers. This includes a commitment to safeguard the state's natural resources, as well as New Hampshire residents' health. Each year, PSNH supports dozens of forest protection, energy conservation and environmental projects through financial contributions and employee volunteerism.

Ospreys Online

In 2000, PSNH launched Project Osprey in partnership with the New Hampshire Fish and Game Department and New Hampshire Audubon, a successful joint

effort to work toward a full recovery for a state-threatened bird of prey.

This project helps to promote greater public awareness of the importance of healthy ecosystems to wildlife populations. Today, the Ospreys Online website provides incredible close-up views of osprey nesting activity for students, bird-watchers and the general public to enjoy. A teacher's curriculum on ecological concepts is available online. Visit www.psnh.com/osprey.



**Public Service
of New Hampshire**

Environmental Community Grants

PSNH's Environmental Community Grant Program provides support to organizations within the company's service territory that are engaged in grassroots projects to protect or preserve the environment, provide education on environmental issues of local interest, or

reclaim and rehabilitate damaged natural environments through organized cleanup efforts. Grants of \$250 to \$1,000 are awarded each spring and fall, with application deadlines on April 15 and October 15 each year.

School Audits and Rebates

PSNH offers rebates to public schools (K – 12) installing energy-efficient technologies such as lighting or HVAC (heating, ventilation and air conditioning) in their facilities. The company also offers energy audits and technical assistance to schools looking to identify and install energy-efficient measures. PSNH administers similar energy conservation programs for its residential, municipal and business customers throughout the state, as well.

For more information on any of these programs, visit www.psnh.com. 

Article courtesy of Martin Murray, Media Relations, PSNH.

Coal – A Vital Source of Electric Power

The production of electrical power from renewable energy sources, such as wind, solar and biomass (wood pellets, etc.), is increasing here in New Hampshire – but the

use of fossil fuels remains the key to meeting increasing demand for electricity for homes and businesses.

Coal is a fossil fuel used for electric power, industry and steel production. Approximately 90% of all coal used in the U.S. is used to produce electrical power. Seven percent is used for industry – the heat generated from coal is used to make paper, concrete, plastics, tar, steel, synthetic fibers, fertilizers and medicines. About 3% of coal is used to produce steel.

The U.S. has more than one-quarter of the world's coal reserves. At current consumption levels, those reserves could last another 200 years. The cost of coal also is relatively stable, in contrast to the rising price of other sources of energy in New England like oil and natural gas.

Coal is a leading source of electrical energy in New Hampshire, representing about 44% of all the power produced by Public Service of New Hampshire (PSNH). To comply with the federal Clean Air Act and toughened regulations associated with New

Hampshire's Clean Power Act (RSA 125-O), PSNH has made improvements at its Merrimack Station and its Schiller Station in Portsmouth, which also uses coal. The company has significantly reduced emissions of nitrogen oxide, a contributor to ozone smog, by installing filters at both power plants. Sulfur dioxide emissions, which contribute to acid rain, have been reduced by 40%, mainly by blending domestic and international coals to create a fuel product that has low sulfur, but adequate heat content. Ash particulates are captured through the placement of screening mechanisms.

Last year, New Hampshire also took an important step toward reducing the emission of mercury from PSNH's coal-fired power plants. In line with new state legislation (RSA 125-O:13), at least 80% of mercury from emissions will be eliminated through the construction of a 'scrubber' at the Merrimack Station by July 1, 2013. The \$250 million project is also expected to result in a 90% reduction of sulfur.

COAL continued on page 6



Lines carry electricity generated by coal-powered Schiller Station in Portsmouth, N.H.

New England Explodes for Natural Gas

Natural gas is a fossil fuel that occurs naturally in the environment as a gas. More than 62.5 million homes use natural gas to fuel stoves, furnaces, water heaters, clothes dryers and other household appliances. It is used to produce steel, glass, paper, clothing, brick, electricity and much more. It is also an essential raw material used to make many common products like paints, fertilizers, plastics, dyes, photographic film, medicines and explosives.

There are 2.3 million natural gas customers in New England – 2.1 million residential customers and about 236,000 commercial and industrial users. The 2005 Energy Information Administration's Annual Energy Outlook forecasts a growth rate in New England's natural gas usage of 1.4% annually through 2025.

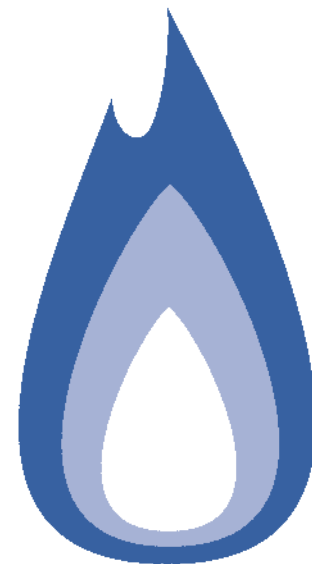
The fastest-growing gas consumption sector, nationally and regionally, is gas for electricity generation. Gas-fired electricity generation in New England accounted for less than 1 percent of its electric supply in 1980; however, today it accounts for over 41% and is expected to provide 49% by 2010. Two new gas-fired power generation facilities have been built in New Hampshire and are major users of natural gas in the state.

Growing demand, particularly in the

power-generation sector, has spawned new growth in the regional gas pipeline infrastructure. In the last decade, New England has added three new pipeline systems, delivering gas from multiple supply points. These pipelines deliver gas from supply basins in the Gulf Coast and regions of Canada.

In addition, New England is the site of one of only four currently operating import terminals for liquefied natural gas (LNG). The terminal is located in Massachusetts and imports gas from Trinidad and Tobago in the Caribbean. There are more than a dozen new LNG facilities proposed for the northeastern U.S. and Canada, and while not all of those projects will be developed, the proposals reflect the markets' response to customer demand and suggest potential opportunities for the region.

Of course with any fossil fuel, there are environmental concerns. Burning natural gas produces carbon dioxide, which affects the environment, when it is produced, stored and transported. Because natural gas is made up mostly of methane (another greenhouse gas), small amounts of methane can sometimes leak into the atmosphere from wells, storage tanks and pipelines. The natural gas industry is working to prevent these leaks.



Exploring and drilling for natural gas will always have some impact on land and marine habitats, but new technologies have greatly reduced the number and size of areas disturbed by drilling, sometimes called "footprints." Satellites, global positioning systems, remote sensing devices and 3-D and 4-D seismic technologies make it possible to discover natural gas reserves while drilling fewer wells.

Natural gas burns cleaner than other fossil fuels. It has fewer emissions of sulfur, carbon and nitrogen than coal or oil, and it leaves almost no ash particles after burning. Being a cleaner fuel is one reason that the use of natural gas, especially for electricity generation, has grown so much and is expected to grow even more in the future.



WEB RESOURCES:

- American Petroleum Institute
www.api.org
- Carbon Coalition
www.carboncoalition.org
- Earth Exploration Toolbook
<http://serc.carleton.edu/eet>
- Energy Information Administration
www.eia.doe.gov
- EPA Climate Change Kids
www.epa.gov/climatechange/kids/animations.html
- EPA Greenhouse Gas Emissions
www.epa.gov/climatechange/emissions/index.html
- NASA Earth Observatory
<http://earthobservatory.nasa.gov/Library/CarbonCycle>
- NCAR Education and Outreach
www.eo.ucar.edu
- N.H. Department of Environmental Services Air Resources
www.des.nh.gov/ard
- N.H. Office of Energy and Planning
www.nh.gov/oep
- The Power Is in Your Hands
www.powerisinyourhands.org
- Public Service of New Hampshire
www.psnh.com
- Rebuild America
www.eere.energy.gov/buildings/program_areas/rebuild.html
- Seabrook Station
www.fpl.com/environment/nuclear/about_seabrook_station.shtml

Living with Carbon

Carbon: The building block of life. You may have heard this phrase, but do you understand what it really means? Carbon is the most abundant element in living things and accounts for approximately 50% of the total mass of plants and animals. Carbon is also present in the earth's atmosphere, soils, oceans and crust, and cycles between these components on varying time scales. On the shortest time scales, seconds to minutes, plants take carbon out of the atmosphere through photosynthesis and release carbon back into the atmosphere via respiration. On longer timeframes, carbon in ancient plants is buried in deep sediments and has formed the deposits of oil and natural gas we use today.

The carbon cycle also has large impacts on the planet, at a variety of spatial scales. At a global scale, the carbon cycle influences the earth's climate and is a key factor keeping ecological systems in balance. Locally, the carbon cycle plays a role in basic ecological processes such as plant growth and decomposition of plant material.

Right now, the most talked about carbon is the compound carbon dioxide (CO₂). Carbon dioxide is a principal greenhouse gas and one that is associated with climate change. Carbon dioxide concentrations in the earth's atmosphere have increased

substantially since the onset of the Industrial Revolution, and scientists have conclusively shown that increases of CO₂ in the atmosphere are a direct result of increased emissions from fossil fuel burning and land use change, primarily deforestation.

Vegetation, soils, and oceans remove large quantities of CO₂ from the atmosphere, playing an important role in climate regulation. However, the future amount of uptake and storage by these components is not fully understood. As scientists, from marine biologists to forest ecologists, gain insight about the carbon cycle and its interacting components, it becomes increasingly important for the public to understand how their own lives relate to such an important issue.

The GLOBE Carbon Cycle Project was designed to meet these needs. The project links an international team of scientists and educational outreach specialists with the GLOBE educational community. Through field exercises, computer modeling, and remote sensing, K-12 teachers

New PLT Education Coordinator

After two-plus years as the education coordinator for New Hampshire Project Learning Tree, Beth Lesure moved on last October to work for Eastern Mountain Sports as a marketing coordinator. Although she will be greatly missed, she won't be completely lost to us, as she will continue on as a board member of the New Hampshire Environmental Educators!

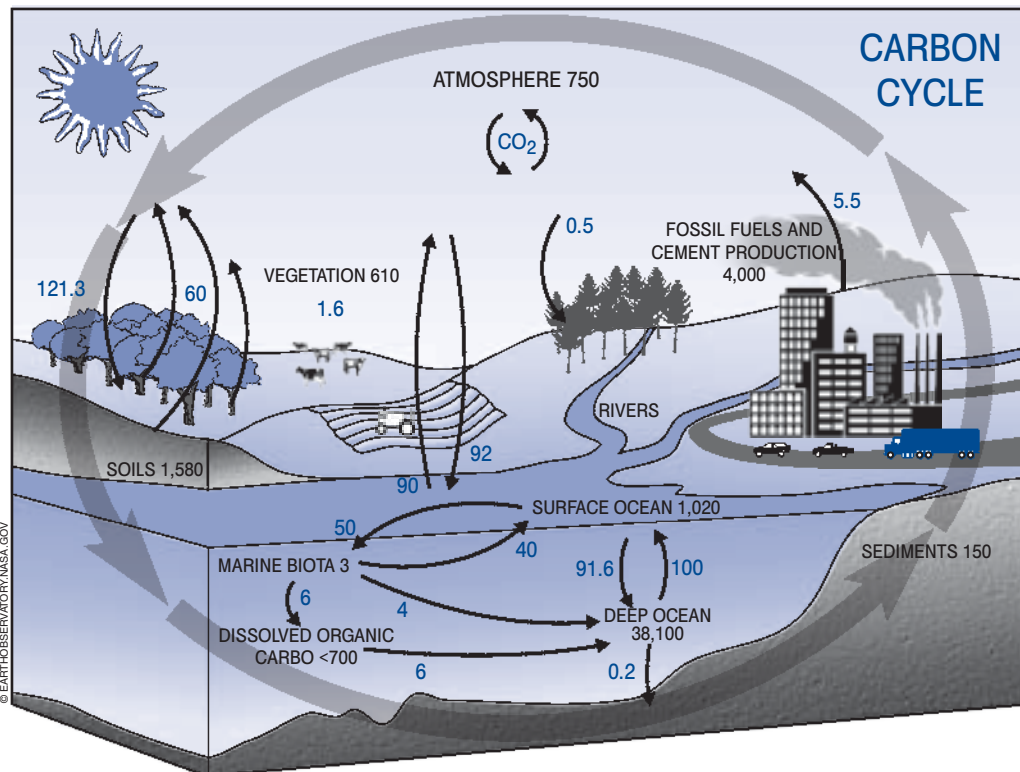
Erin Walsh is continuing Beth's great work at PLT. Erin has worked as a Naturalist Educator for N.H. Audubon at the Prescott Farm facility in Laconia. In her work there, she was an in-school naturalist at the Belmont and Gilman-ton elementary schools. Prior to joining N.H. Audubon, Erin managed a multi-year, in-school naturalist program in the Framingham public schools for the New England Wildflower Society, where she gained experience in teacher professional development, program evaluation and grant reporting.

Erin offers a wonderful mix of knowledge, experience and enthusiasm that will benefit PLT and the hundreds of teachers it serves annually. Erin can be reached at (603) 226-0160 or info@nhplt.org.



Erin Walsh

© NHFG / JANE VACHON PHOTO



and students will gain knowledge about current carbon cycle research, develop strong analytical skills and have an overall increase in their environmental awareness. Although this project is in the development stages, for more information, contact Sarah Silverberg at (603) 862-2972 or sarah.silverberg@unh.edu. For general GLOBE information visit www.globe.gov.



Article courtesy of Sarah Silverberg,
Research Technician, Forest
Ecosystems Group, UNH

In any given year, tens of billions of tons of carbon move between the atmosphere, hydrosphere, and geosphere. Human activities add about 5.5 billion tons per year of carbon dioxide to the atmosphere. The illustration to the left shows total amounts of stored carbon in black and annual carbon fluxes in blue. (Illustration courtesy NASA Earth Science Enterprise)

Project WILD and WILD Aquatic

March 10, from 9 a.m. to 4 p.m., at N.H. Fish and Game headquarters in Concord. Go WILD in your classroom with this activity-based, supplementary curriculum, a great resource for teaching wildlife and environmental concepts. For more information and to register contact Mary Goodyear at mgoody@ncia.net or at (603) 419-0256; or visit www.wildlife.state.nh.us/Education_calendar.htm.

Environmental Pathways in the Classroom

March 24, from 9 a.m. to 5 p.m., at the Great Bay Discovery Center in Greenland. Joint workshop of Projects WET, WILD and Learning Tree. To register contact Jessica Morton at (603) 271-4071 or jmorton@des.state.nh.us or visit www.des.nh.gov/wet/wetsched.htm.

New Hampshire Environmental Educators Annual Meeting

"Follow the Child, Into the Wild" is the theme of the NHEE annual meeting, which takes place on March 31, from 9 a.m. to 4 p.m., at the Great Bay Discovery Center in Greenland. A venue for formal and non-formal educators to learn about current issues facing teachers, explore strategies for getting students outside, network with fellow environmental educators and plan for the future. For more information, contact Beth Lesure at nheeconference@hotmail.com.

Discover WILD New Hampshire Day

April 21, from 9 a.m. to 3 p.m. A fun day of hands-on, educational activities for the whole family at the New Hampshire Fish and Game Department headquarters at 11 Hazen Drive in Concord. Free admission. For information, call (603) 271-3211 or visit the Fish and Game website at www.wildnh.com.

Project WET Workshop

April 28, from 9 a.m. to 3 p.m., at the Great Bay Discovery Center in Greenland. New Hampshire and Maine Project WET. To register, contact Jessica Morton at (603) 271-4071 or jmorton@des.state.nh.us or visit www.des.nh.gov/wet/wetsched.htm.

2007 NH Drinking Water Week Festival

The New Hampshire Drinking Water Week Coalition will hold its annual Drinking Water Week Festival on May 9, at the Deerfield Fairgrounds in Deerfield. Local fourth and fifth grade classes within the Lamprey River Watershed are invited to attend at no cost. The festival includes a theatre or musical performance, hands-on water activities and the state water science fair finals. For information, contact Jessica Morton at (603) 271-4071 or jmorton@des.state.nh.us or visit www.des.nh.gov/wsebl/waterfest.

WOW! The Wonders of Wetlands

May 19, from 9 a.m. to 4 p.m., at the Great Bay Discovery Center in Greenland. Presented by Environmental Concern and N.H. Project WET. Contact Jessica Morton at (603) 271-4071 or jmorton@des.state.nh.us or visit www.des.nh.gov/wet/wetsched.htm for a registration form.

2007 Envirothon Set for May 24

High school classes are invited to participate in the 2007 New Hampshire Envirothon, a high school competition designed to build knowledge of water resources, forests, soils, wildlife and current environmental issues. This year's theme is "Energy and the Environment." For more information, contact Herb Vadney at (603) 279-3436 or visit www.envirothon.org.

SERESC, WET, WILD and PLT Workshop

This five day professional development opportunity, June 25-27, and July 11 and 12, for science teachers will be held in Concord. Topics will include biodiversity, wildlife patterns, watersheds, forest succession and much more. For more information, please contact Sandy Kent at (603) 529-3364 or email kentss@gsinet.net.

Watershed Ecology: Summer Course for Science Teachers and Community Leaders

Two-week course (Monday through Friday) offered July 23-August 3, from 8:30 a.m. to 4 p.m., at Bow High School. Watershed Ecology is an undergraduate and graduate-level summer program geared to science educators and community leaders. Coordinated by staff from New Hampshire Fish and Game, the course offers techniques

for applying science in real-world situations. Each day, specialists focus on a different aspect of watershed ecology. Hands-on, experiential learning is emphasized in both field and classroom settings. The course can be taken for 2 credits from the UNH Division of Continuing Education or as a non-credit course. Contact Judy Tumosa, Fish and Game Aquatic Resources Education Coordinator, at (603) 271-3212 or email judy.tumosa@wildlife.state.nh.us.

Curriculum Connections through Schoolyard Investigations

August 14-16 and August 20-21, at the Urban Forestry Center in Portsmouth, N.H. The New Hampshire Education and Environment Team invites educators of grades K-8 to a five-day professional development institute designed to incorporate the new science frameworks. Participants will have an opportunity to design an interdisciplinary schoolyard or community investigation tailored to their school and curriculum. All instruction, manuals and other materials for projects WET, WILD, WILD Aquatic, Learning Tree, HOME and GLOBE are included in the \$200 registration fee. For information about the institute and how to register, contact Jennifer Bourgeault at jen.bourgeault@unh.edu or (603) 862-4178 or visit www.nhplt.org/NHEET.htm.

COAL continued from page 3

Burning fossil fuels like coal also results in the emission of carbon dioxide, a gas linked to global warming. While the State Legislature and others consider actions to reduce carbon emissions while still satisfying our demand for energy, some steps have already been taken. In Portsmouth, for example, PSNH recently retired one of its three coal-fired boilers at Schiller Station and replaced it with a new boiler that burns clean wood products, eliminating the consumption of about 130,000 tons of coal annually. For more information on PSNH's coal plants, visit www.psnh.com.



ON THE H.O.M.E. FRONT

Wildlife Food Plants Banned

Three Invasive Species Added to the State List

by Marilyn Wyzga

Are you planning a wildlife garden or habitat area for your schoolyard? Be sure to cross burning bush (*Euonymus alatus*) and Japanese barberry (*Berberis thunbergii*) off your plant list. These two shrubs, along with Norway maple (*Acer platanoides*), are now on the list of New Hampshire Invasive Species. As of January 1, 2007, they are banned from sale, distribution and propagation in New Hampshire.

Barberry and burning bush, as well as other banned plants like oriental bittersweet, certain shrub honeysuckles, and autumn olive, used to be recommended as wildlife food sources. The characteristic that has made them so popular for feeding wildlife – their abundant fruits – also contributes to their invasive tendencies. An exotic (non-native) plant that heavily produces fruit can out-compete native plants when it comes to reproducing as seedlings. Often, birds devour the fruits and deposit the seeds far and wide, through native plant communities. Some studies also suggest the food quality of the fruits produced by these exotic species is not as valuable as that of the native plants the animals typically eat.

Pathways of Plant Invasion

Like Glinda the Good Witch asking Dorothy, “Are you a good witch, or a bad witch?” it all comes down to the situation. Exotic does not equal invasive. Many exotic plants have been growing in this country for hundreds of years, and are still “well-behaved;” consider, for instance, many of our agricultural crops. However, a plant (or insect or other animal) typically travels to a new land without its natural predators

in tow. If nothing in the new location feeds on it, or threatens it with disease, this species gets a leg up. If it is a plant that also has the advantage of rapid growth rate and aggressive growth habit, and it is adapted over a wide range of planting zones, it will likely displace native communities and change the ecology of a system. Invasive species can be devastating to natural communities, to agriculture, to human health and/or to the economy.

Some plants arrive in this country by way of intentional introductions, that is, they are intended for erosion control, water/heavy metals treatment, forage or pasture, forestry or fiber, ornamental use, or wildlife food and habitat. Others arrive by accident, as a contaminant in hay/feed/seed or packaging material, through land disturbance, or by seeds carried on shoes, clothes or vehicles.

Making the List

Legislative rule established the New Hampshire Invasive Species Committee (ISC) and charged this group with listing invasive species that pose a substantial threat to the state’s environment, commercial agriculture, forest crop production and human health. The 11 appointed committee members represent several New Hampshire state agencies, including the departments of Agriculture, Markets and Food; Environmental Services; Transportation; Recreation and Economic Development; and Fish and Game; plus the University of New Hampshire, Cooperative Extension, The Nature Conservancy and horticultural, public and livestock owners interests. ISC members carefully evaluate plant species by a strict list of criteria on a regular basis. Research and results from studies in other states help shape the list. The first group of species were listed and banned in 2004.

Replacing Invasive Species

In addition to the work of the N.H. Invasive Species Committee, grassroots



Invasions of thorny Japanese barberry can create impassable thickets in woodlands.

© MAINE COOPERATIVE EXTENSION

efforts around the state help control and eradicate invasives. Individual lake associations, volunteer groups, garden clubs, schools and landowners remove and replant areas overrun with invasives, and employ bio-controls, such as introducing the beetle that eats purple loosestrife.

If you plan to remove any of these species from your landscape, be sure to investigate the best methods for removal. Be prepared to replace them with other wildlife-beneficial, fruit bearing plants, because animals have likely come to depend on them as food sources and will return to those same locations to feed.

HOME continued on next page

Common terms to know:

Native - Occurs in the ecosystem, not introduced (per RSA 430:52).

Alien - Not native to the ecosystem (per RSA 430:52). Also called Exotic.

Aggressive - Describes plants (such as poison ivy and sumac) that invade a site, but don’t cause environmental or economic damage.

Invasive - Describes an introduced species likely to cause environmental or economic harm (per RSA 430:52). Invasive species are those species that tend to quickly dominate a system. Both native and exotic species can be invasive, but typically exotic invasives are more problematic.

To help prevent oil spills, ships are now required to have a "double-hull" lining to protect against spills and all underground storage tanks are being replaced by tanks with a double lining. This has not happened everywhere yet. In some places where gasoline has leaked from storage tanks, one of the gasoline ingredients, methyl tertiary butyl ether (MtBE) has made its way into local drinking water supplies. A number of states are banning the use of MtBE in gasoline (New Hampshire is one of them), and the refining industry is voluntarily moving away from using it when blending reformulated gasoline.

When petroleum products are burned as fuel, they release carbon dioxide, which is a greenhouse gas. Since most oil used is for transportation, environmental laws are being written aimed at changing the make-up of gasoline and diesel fuel so that they produce fewer emissions. Hopefully, in years to come, these changes will allow us to reduce the greenhouse gas emissions that result from the use of oil.



It makes good design sense to include a diverse mix of plants in your landscape, rather than relying on one or two kinds. The New Hampshire State Nursery provides one good local source of seedling stock of other wildlife-valuable plants. Check with your local grower or garden center for others.

True, we've lost some favorite plant specimens from our horticultural market. The good news is that there are plenty of native and non-invasive plants that provide abundant wildlife food and cover, while supplying color, fragrance and interest for our landscapes.

For more information about the invasive species and related legislative rules, visit www.agriculture.nh.gov/divisions/plant_industry/index.htm. To contact the N.H. State Nursery, visit www.nhnursery.com. For a list of alternative plantings to replace burning bush, Norway maple and Japanese barberry in your landscape, visit extension.unh.edu/Pubs/

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You can spot escaped burning bush in woodlands when its distinctively brilliant fall color emerges.

HGPubs/altinvs2.pdf. For a copy of the *Guide to N.H. Invasive Species*, please contact Marilyn Wyzga, at (603) 271-3211 or mw-yzga@wildlife.state.nh.us. Be sure to include your mailing address.



Do you have an idea for a topic the WEB should address? If so, please contact Esther Cowles at (603) 226-0160 or info@nhplt.org.

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